Adult Influenza Vaccinations Reported to the Wisconsin Immunization Registry by Retail Pharmacies, 2011-2014

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Abstract

Objective: Evaluate the number of vaccinations given to Wisconsin adults by retail pharmacies, focusing on seasonal influenza vaccination.

Methods: Data from the Wisconsin Immunization Registry (WIR) were analyzed to determine influenza vaccination rates for adults residing in Wisconsin during the 2011-12, 2012-13 and 2013-14 influenza seasons. The number of influenza doses provided by retail pharmacies by age group and county were assessed by influenza season and compared to the number of other recommended adult vaccines provided by retail pharmacies.

Results: The number and percentage of adults who had an influenza vaccination reported to the WIR increased from the 2011-12 influenza season to the 2013-14 season; the largest increase occurred among adults aged ≥65 years from 54.2% to 63.0%. During the same period, the number of retail pharmacies enrolling and submitting data to the WIR and the number of influenza doses given by pharmacies increased, but the proportion of adult doses reported by pharmacies remained relatively constant. In the 2013-14 influenza season, retail pharmacies reported to the WIR 10.0%, 14.1% and 20.2% of the influenza doses for clients aged 18-49 years, 50-64 years and ≥65 years, respectively. In every year observed, seasonal influenza vaccine made up ≥83.5% of adult vaccines reported by retail pharmacies.

Conclusion: This analysis provides evidence that the WIR is valuable in measuring immunization uptake among adults. Wisconsin's adult influenza immunization rates remain lower than the Healthy People 2020 goals; however, retail pharmacies are playing an important part in immunizing adults and providing additional venues for adult vaccination.

Immunizations continue to be recognized as one of the top ten public health achievements, preventing significant morbidity and mortality throughout the world.[1] Wisconsin strives to improve the health of all of its residents by increasing their immunization rates. Despite these efforts, immunization rates in adults continue to lag. The Behavioral Risk Factor Surveillance Survey (BRFSS) estimated influenza vaccination coverage among Wisconsinites during the 2013-14 influenza season as 33.9% for adults aged 18-64 years and 56.7% for adults aged ≥65 years, rates that are slightly lower than the national estimates of 36.7% and 65.0%, respectively[2]; both measures are well below the Healthy People 2020 influenza targets of at least 80% for 18-64 year olds and 90% for adults 65+ years.[3] In addition to influenza vaccine, older adults and adults with health conditions are recommended to receive pneumococcal, zoster and tetanus-diphtheria-acellular pertussis (Tdap) vaccines, and may need other vaccines based on their age and disease history.

In Wisconsin and across the United States, pharmacies are playing an increasing role in protecting persons from vaccine preventable diseases by offering and administering vaccinations. Pharmacies and other non-traditional settings are often more accessible and convenient places to obtain immunizations than other clinic types, especially for medically underserved adults.[4] Retail pharmacies commonly advertise and offer influenza vaccinations; however, many also provide other recommended vaccines. As of January 2015, 46 states/territories allowed pharmacists to provide any vaccine and the additional 6 states/territories allowed pharmacists to provide certain vaccines. In Wisconsin, pharmacists can immunize any client aged ≥6 years with recommended vaccines by prescriber issued protocols.[5]

Regardless of state laws allowing them to vaccinate, pharmacists still face obstacles in the vaccine delivery process. In a national survey, pharmacists themselves rated lack of time, concern for legal liability, and lack of reimbursement as the top three obstacles to the provision of immunization services.[6] Additionally, keeping up to date with changing vaccine recommendations and ensuring appropriately timed vaccination can be a barrier to providing vaccinations.

The Wisconsin Immunization Registry (WIR) is a statewide, population-based immunization information system (IIS) that assists pharmacists and other health care providers by recommending needed vaccines and providing guidance on the proper ages and intervals at which

TABLE 1. Wisconsin Population Estimates (2013) and Wisconsin Immunization Registry (WIR) Adult Demographics

	2013 Wisconsin Population Estimates[7]	*Wisconsin Residents in WIR*[‡] *(% of Census)*
Adults 18+ Years	4,434,937	5,014,668 (113)
18-49 Years	2,379,514	2,832,440 (119)
50-64 Years	1,205,456	1,140,793 (95)
65+ Years	849,967	1,041,435 (135)

[‡]*As of January 1, 2015*

TABLE 2. Retail Pharmacies Enrolled and Submitting Data to the Wisconsin Immunization Registry (WIR), 2011-2014

	Pharmacy Sites Enrolled in the WIR (n)		*Pharmacy Sites Actively Submitting Data to the WIR (n %)*
Year	**New**	**Cumulative**	
2011	102	326[a]	98 (30.1)
2012	271	597	339 (56.8)
2013	21	618	366 (59.2)
2014	8	626	375 (59.9)

[a]*224 pharmacies have WIR enrollment dates prior to 2011.*

vaccines should be administered. The WIR integrates information from birth and death records, public and private health care providers, pharmacies, health maintenance organizations and Medicaid and allows proper assessment of clients' complete vaccination histories to ensure appropriate vaccination. Along with the ability to record immunizations from many different providers, the WIR validates a patient's immunization history and identifies recommended vaccinations, produces individual clinic and statewide vaccination coverage rates, manages vaccine inventory, and produces reminder/recall notices, all at no cost to providers.

The purpose of this study was to evaluate the number of vaccinations given to Wisconsin adults by retail pharmacies, based on data reported to the WIR. The evaluation focused on seasonal influenza vaccination coverage among adults.

Methods

Data from the WIR were analyzed to determine influenza vaccination coverage for adults residing in Wisconsin. Influenza vaccination coverage was calculated using the number of influenza vaccine doses administered and reported to the WIR, by any provider type, as the numerator and the 2013 population estimates for Wisconsin[7] as the denominator. Influenza vaccination coverage was calculated by adult age cohort (18-49 years, 50-64 years, ≥65 years) and influenza season during which the dose was administered (July 1, 2011 through June 30, 2012; July 1, 2012 through June 30, 2013; and July 1, 2013 through June 30, 2014).

We determined the number of retail pharmacies with a WIR account and submitting data to the WIR by calendar years 2011 through 2014 and the number of influenza doses administered and reported by these retail pharmacies in each

FIGURE 1. Wisconsin Influenza Vaccination Coverage, Based on Doses Reported to Wisconsin Immunization Registry and CDC Behavioral Risk Factor Survey Data (BRFSS)[2], by Client Age at Vaccination and Influenza Season

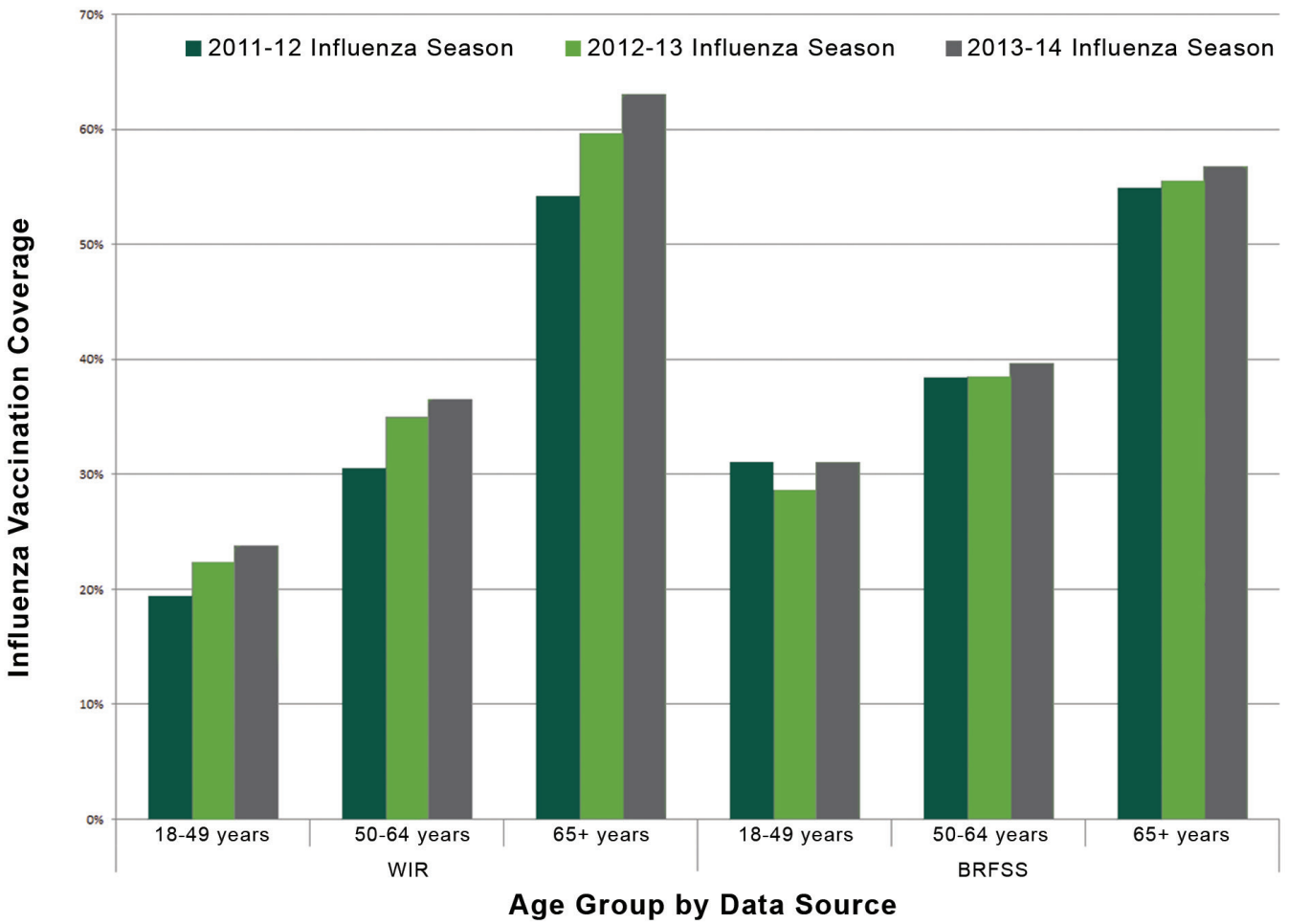
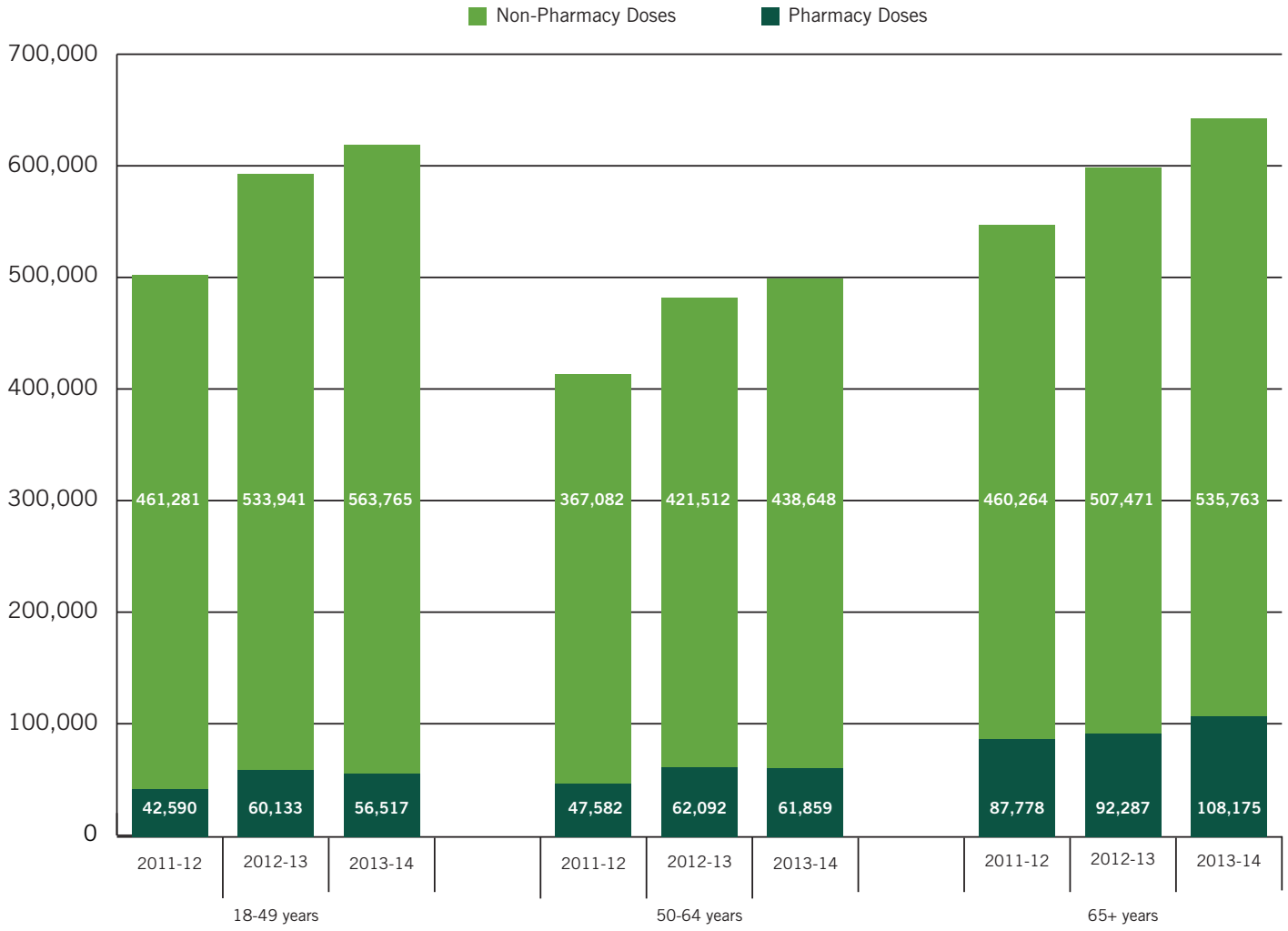


FIGURE 2. Influenza Vaccines Administered and Reported to the Wisconsin Immunization Registry by all Provider Types and Retail Pharmacies Only, by Client Age at Vaccination and Influenza Season



season. The proportions of adult influenza vaccines reported by retail pharmacies by age group, Wisconsin county of residence and influenza season were calculated. A map of the proportion of adult influenza vaccines administered by retail pharmacies during the 2013-14 influenza season by client's county of residence was developed. Doses administered by pharmacies that are not in retail settings (e.g., hospital or clinic pharmacies) were not included in the retail pharmacy group.

Additionally, among vaccines administered by retail pharmacies and reported to the WIR, we calculated the percentages of other vaccines administered to adults by vaccine type (tetanus-diphtheria (Td)/Tdap, zoster and pneumococcal (PPSV23/PCV13) and calendar year (2011, 2012, 2013, 2014) and compared them to the proportion of influenza vaccines administered to adults.

Results

Wisconsin Adult Influenza Vaccination Coverage

The US Census Bureau estimates there were 4,434,937 adults aged ≥18 years residing in Wisconsin in 2013, of which 849,967 were adults aged ≥65 years.[7] As of January 1, 2015, there were 5,014,668 (113% of census) adults aged ≥18 years with WIR records containing a Wisconsin address. The percentage of Wisconsin adults with a client record in the WIR varied by age group (Table 1.); WIR population sizes as of January 1, 2015 were 119%, 95%, and 123% of the Census estimates for WIR clients aged 18-49 years, 50-64 years and ≥65 years, respectively.

Using WIR data, adult influenza vaccination coverage increased from the 2011-12 influenza season to the 2013-14 influenza season for all adult age cohorts (Figure 1.); influenza vaccination coverage in the 2013-14 influenza season was 23.7%, 36.4%, and 63.0% among adult WIR clients aged 18-49 years, 50-64 years and ≥65 years, respectively. Adult WIR clients aged ≥65 years showed the greatest percentage point change in seasonal influenza coverage, from 54.2% in the 2011-12 influenza season to 63.0% in the 2013-14 influenza season.

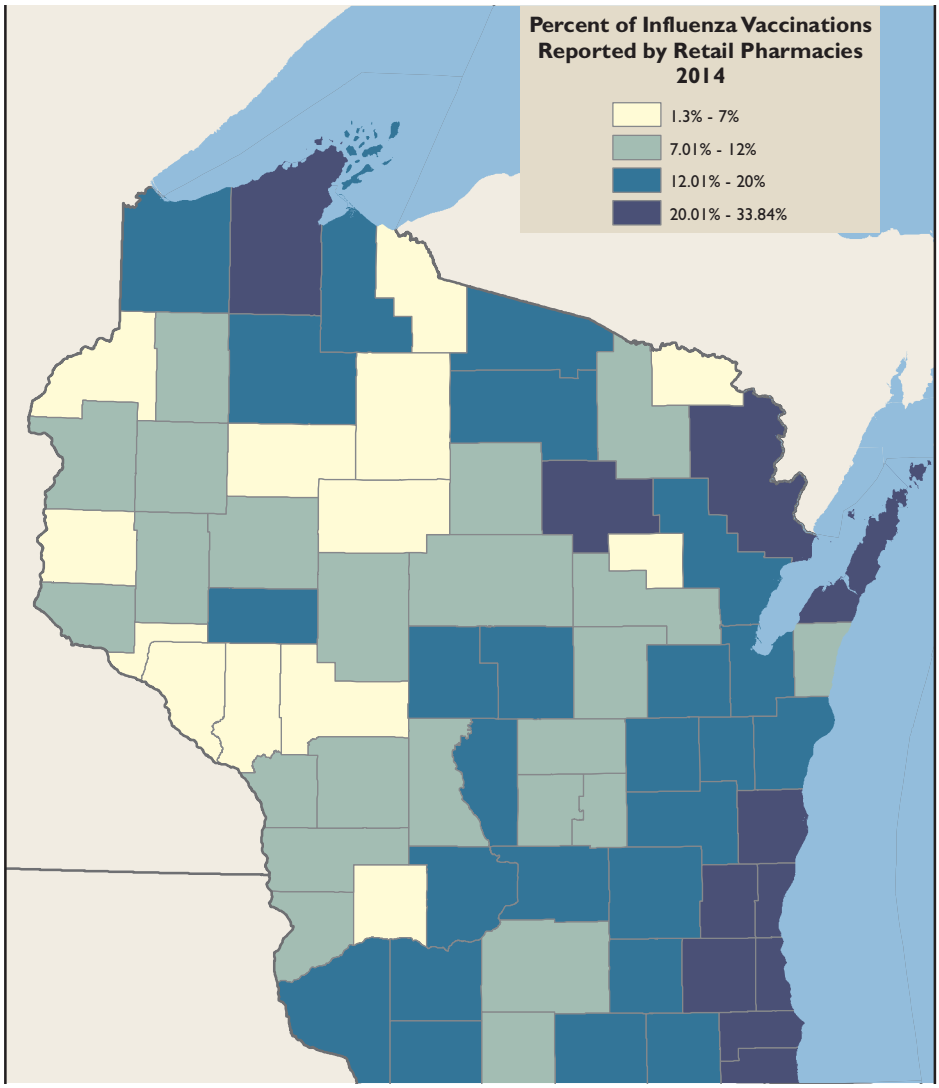
Retail Pharmacy Participation

Table 2 describes WIR enrollment and use among Wisconsin retail pharmacies. The number of new retail pharmacies enrolling in the WIR varied by calendar

year from a high of 271 in 2012 to only 8 in 2014. The number of retail pharmacies actively submitting data to the WIR increased from 98 in 2011 to 375 in 2014. The number of adult influenza doses reported to the WIR by retail pharmacies increased from the 2011-12 season to the 2013-14 season for all adult age groups (Figure 2.). In the 2013-14 influenza season, retail pharmacies reported 226,551 adult influenza doses which made up 10.0%, 14.1% and 20.2% of overall adult influenza doses reported to the WIR for Wisconsin clients aged 18-49 years, 50-64 years and ≥65 years, respectively. The proportion of WIR clients aged ≥18 years receiving an influenza vaccine at a retail pharmacy in the 2013-14 influenza season ranged from 1.3% in Florence County to 33.8% in Kenosha County (Figure 3.).

Among vaccine doses administered by retail pharmacies and reported to the WIR, the proportion of zoster, pneumococcal or Td/Tdap vaccines remained fairly steady from 2011 to 2014 (Figure 4.). In 2014, of the 281,042 adult vaccine doses administered at a Wisconsin retail pharmacy 7.2%, 2.3% and 2.5% were zoster, pneumococcal and Td/Tdap, respectively.

FIGURE 3. Percent of Influenza Vaccines Administered to Adults Aged 18+ Years and Reported to the Wisconsin Immunization Registry by Retail Pharmacies during the 2013-14 Influenza Season, by Client County of Residence



Discussion

The WIR

Results of this study highlight that the WIR is a valuable tool for estimating Wisconsin adult vaccination coverage and measuring the progress of retail pharmacies in administering vaccines. Although the WIR has only received client demographic information for all births since 1995 from the Wisconsin Division of Public Health Vital Records Office it still contains a robust adult population, demonstrating that many types of adult health care providers are sending their adult data to the registry. Retail pharmacies have been regularly enrolling since 2011.

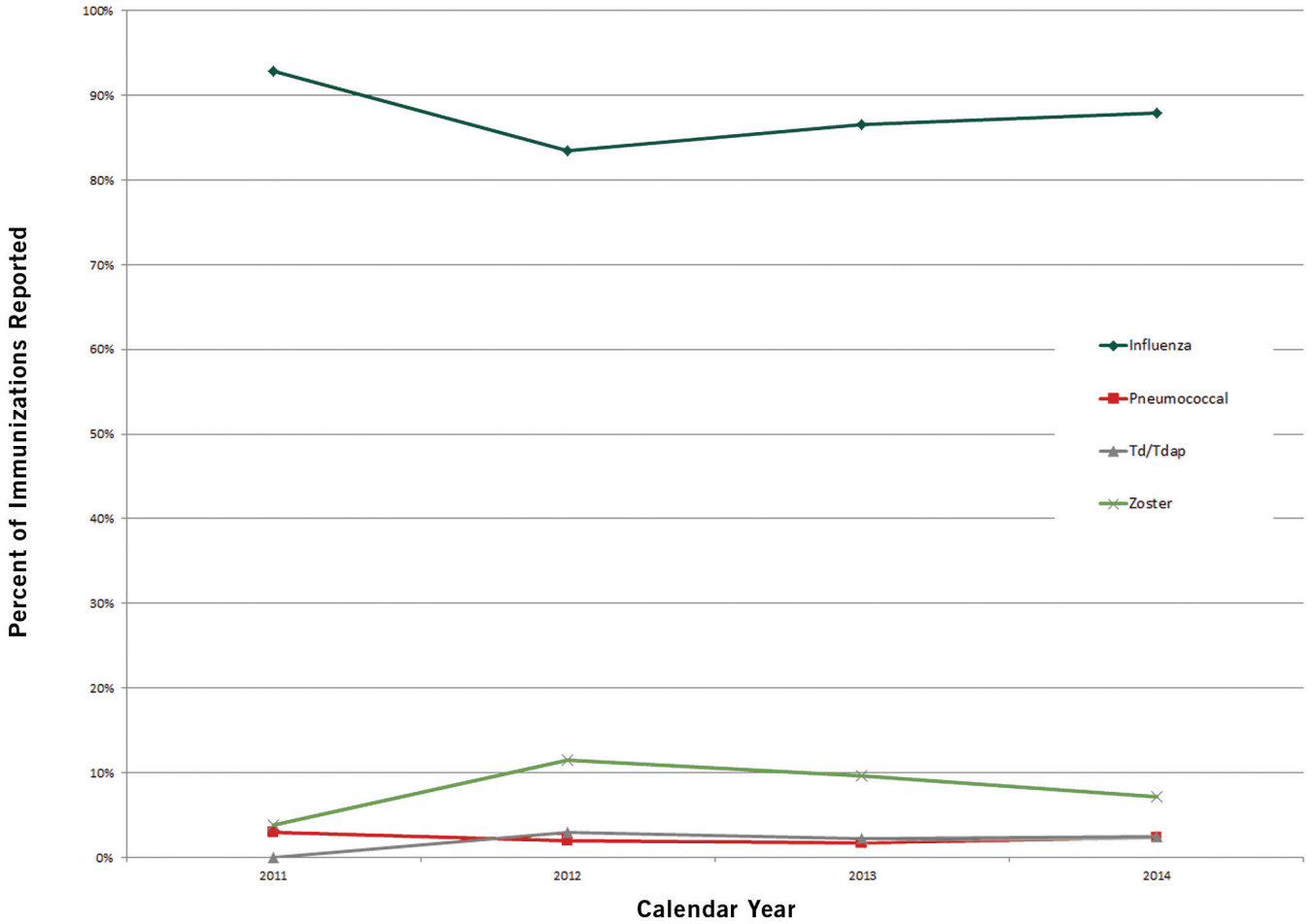
Influenza Vaccination Rates

Using WIR data, adult influenza vaccination coverage increased 4.3%, 5.9% and 8.8% from the 2011-12 influenza season to the 2013-14 influenza season for adults aged 18-49 years, 50-64 years and ≥65 years, respectively. In contrast, CDC's BRFSS estimates for influenza vaccination coverage in Wisconsin adults did not show as marked of increases; Wisconsin BRFSS influenza vaccination coverage estimates changed -0.1%, 1.2% and 1.8% from the 2011-12 influenza season to the 2013-14 influenza season for adults aged 18-49 years, 50-64 years and ≥65 years, respectively (Figure 1.). Given the consistent methods of BRFSS data collection over time, the increase in influenza rates among adults using WIR data may be a result of increased reporting of adult influenza doses to the WIR, rather than an actual increase in influenza vaccination coverage.

Role of Pharmacists

Pharmacies are playing an increasingly important role in vaccinating adults and given their training and access to patients filling prescriptions, pharmacists are in a unique position to serve as educators, facilitators and immunizers.[4] Our study suggests that, of the influenza doses reported to the WIR, in the 2013-14 season, retail pharmacies provided seasonal influenza vaccine to 1 in 5 Wisconsin adults aged ≥65 years, a group that is typically at highest risk of influenza-related complications. These results, and the increase in retail pharmacies enrolling and actively submitting data to the WIR, suggest that retail pharmacy vaccination may have had an impact on increasing the number of influenza doses reported to the WIR for adults aged ≥65 years by 8.8%

FIGURE 4. **Percent of Adult Vaccinations Reported to the WIR by Retail Pharmacies, by Vaccine Type and Calendar Year, 2011-2014**



from the 2011-12 influenza season to the 2013-14 season. Furthermore, in some Wisconsin counties, retail pharmacies are responsible for reporting 1 of every 3 influenza vaccine doses recorded in the WIR for adults aged ≥18 years.

In addition to providing another location for adults to receive influenza vaccine, pharmacy-provided vaccinations have also been shown to benefit the individual. One study found that influenza vaccination delivery via pharmacies is less costly than delivery in scheduled doctor's office visits[8], which highlights that retail pharmacies may be more convenient and more affordable for adults at all income levels.

There is still work that needs to be done regarding vaccination at retail pharmacies. Although pharmacists in Wisconsin are allowed to administer all recommended vaccines, when compared to influenza vaccine, retail pharmacy administration of zoster, pneumococcal and Td/Tdap vaccine remained low. There are a few possible reasons for this observation. First, it may be more likely that adults receive zoster, pneumococcal and Td/Tdap vaccine as part of their regular visit with their health care provider. Furthermore, these other adult vaccines are not recommended annually like influenza vaccine. As a result, over the observed period of 2011-2014 one person may have gone to the pharmacy three times to receive seasonal influenza vaccine but only one time to become up-to-date for the other recommended adult vaccines, leading to fewer doses of non-influenza vaccines being administered. Third, it is possible that some insurance plans do not cover pharmacist administration of certain vaccines. Additional work by retail pharmacies and adult immunization providers is needed to address low adult vaccination coverage. Data from a 2013 survey shows that among adults for whom zoster, pneumococcal and Tdap vaccines are recommended, vaccination rates in the United States may be as low as 24.2%, 59.7% and 17.2%, respectively.[9] This data, and our analysis, suggest that future research should focus on identifying barriers retail pharmacies may be facing related to adult immunization and solutions to help remove those barriers and increase access to adult vaccination services at retail pharmacies.

Finally, while the number of retail pharmacies actively participating in the WIR has increased steadily since 2011, there are still at least 40% of retail pharmacies with WIR accounts that are not entering immunization information into the WIR on a regular basis. Given that some adults visit multiple health care providers, entry into the WIR of immunizations provided in all settings is necessary to ensure that patients are not over-vaccinated.

Limitations

The WIR population size for adults

(113% of population estimate) highlights a known limitation of IIS data: denominator inflation. These inflated population denominators occur due to clients not having their address changed when they move out of state and instead maintaining an 'active' status in WIR associated with a Wisconsin address. As a result, we chose to use Census estimates for our population denominators when calculating vaccination coverage among Wisconsin adults. An additional limitation is that, although the WIR is a population-based registry, it is possible that adult vaccinations are under-reported to the WIR because of the ongoing difficulty of adult provider identification and enrollment in WIR. Despite these limitations of using WIR data to assess vaccination uptake, our estimate of influenza vaccination among adults was similar to estimates for Wisconsin adults from the 2013-14 BRFSS of adults, which suggests that WIR data is relatively complete (Figure 1.).

Lastly, we do not currently have a complete picture of how many retail pharmacies are vaccinating in Wisconsin. Without a denominator, it is hard to determine how many retail pharmacies are vaccinating and remain un-enrolled in the WIR. This same limitation holds true when comparing retail pharmacies with other provider types. It is possible that non-pharmacy providers may be more consistently reporting to the WIR than retail pharmacies.

Conclusion

This analysis provides evidence that IISs, like the WIR, are valuable in measuring adult vaccination uptake. Wisconsin's adult influenza vaccination rates remain much lower than the Healthy People 2020 goals; however, retail pharmacies are playing an increasingly important part in vaccinating adults and providing additional venues for adult vaccination. Partnerships between IISs and retail pharmacies are necessary for measuring progress in administering and reporting adult vaccinations. Future studies should investigate whether retail pharmacies are playing a lead role in expanding the venues to receive vaccination in some counties and, if so, what the characteristics of those counties are. In addition, subsequent studies should identify if there are any significant age- or risk-related differences between adults who utilize retail pharmacies for their vaccination services and those that are immunized at other types of clinics and the impact that retail pharmacies have on childhood vaccination rates. ●

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Acknowledgements: Ruth Koepke, MPH, Stephanie Schauer, PhD and Matthew Verdon, Wisconsin Immunization Program.

Disclosures: Results from this analysis were previously presented at the 2015 National American Immunization Registry Association (AIRA) meeting (New Orleans, Louisiana, April 21-23).

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